

Title (en)

Magnetoresistive head using sense currents of opposite polarities

Title (de)

Magnetoresistiver Kopf mit Leseströmen gegensätzlicher Polaritäten

Title (fr)

Tête magnétorésistive utilisant courants de lecture de polarités opposées

Publication

**EP 0803862 A3 19980805 (EN)**

Application

**EP 97106307 A 19970416**

Priority

US 63605996 A 19960423

Abstract (en)

[origin: US6163426A] A magnetoresistive head achieves maximum signal output with minimal electromigration by using a magnetoresistive element through which a unidirectional sense current is flown. Periodically, a control circuit determines whether one or more switching criteria have been met, and applies a counter-directional compensation current in the magnetoresistive element when the switching criteria are met, thus suppressing electromigration in the magnetoresistive element in the direction of said sense current. In a preferred embodiment, the compensation current is applied during a quiescence period. In another embodiment a continuous unidirectional sense current is flown through the magnetoresistive element, and the control circuit suspends the sense current in the magnetoresistive element for a period of time when one or more switching criteria have been met, so as to prevent atomic excursion beyond one atomic diameter, such that electromigration in the magnetoresistive element is substantially reduced in the direction of the sense current.

IPC 1-7

**G11B 5/02**; **G11B 5/40**; **G11B 5/39**

IPC 8 full level

**G11B 5/39** (2006.01); **G11B 5/012** (2006.01); **G11B 5/02** (2006.01); **G11B 5/035** (2006.01); **G11B 5/40** (2006.01); **G11B 5/455** (2006.01); **G11B 5/49** (2006.01); **G11B 5/00** (2006.01); **G11B 5/09** (2006.01); **G11B 19/04** (2006.01)

CPC (source: EP US)

**B82Y 10/00** (2013.01 - EP US); **B82Y 25/00** (2013.01 - EP US); **G11B 5/012** (2013.01 - EP US); **G11B 5/02** (2013.01 - EP US); **G11B 5/035** (2013.01 - EP US); **G11B 5/40** (2013.01 - EP US); **G11B 5/455** (2013.01 - EP US); **G11B 5/4923** (2013.01 - EP US); **G11B 5/09** (2013.01 - EP US); **G11B 19/04** (2013.01 - EP US); **G11B 2005/0008** (2013.01 - EP US); **G11B 2005/0016** (2013.01 - EP US); **G11B 2005/0018** (2013.01 - EP US); **G11B 2005/3996** (2013.01 - EP US)

Citation (search report)

- [A] PATENT ABSTRACTS OF JAPAN vol. 018, no. 685 (P - 1848) 22 December 1994 (1994-12-22)
- [A] PATENT ABSTRACTS OF JAPAN vol. 017, no. 681 (P - 1660) 14 December 1993 (1993-12-14)
- [A] PATENT ABSTRACTS OF JAPAN vol. 095, no. 006 31 July 1995 (1995-07-31)
- [A] PATENT ABSTRACTS OF JAPAN vol. 095, no. 009 31 October 1995 (1995-10-31)

Cited by

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Designated contracting state (EPC)

DE NL

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**US 6163426 A 20001219**; EP 0803862 A2 19971029; EP 0803862 A3 19980805; JP H1074306 A 19980317; US 5793550 A 19980811

DOCDB simple family (application)

**US 11217398 A 19980708**; EP 97106307 A 19970416; JP 11861497 A 19970423; US 63605996 A 19960423